

and methods introduced by him have passed through the text-books into the electrotechnic practice.

In the time that separates this period of experimental activity from its resumption in 1873 fall ten years devoted to the organisation of secondary education and the reorganisation of the higher technical instruction in Holland, which have proved a great boon to the country. The secondary schools have spread enlightenment everywhere, and, providing everywhere the preparatory instruction necessary for attending the polytechnicum, they laid the foundation for the development which technics have taken in Holland. Equipped as they were by Bosscha's influence with physical and chemical laboratories, they have since attracted to science the greater number of the men of the present generation that have devoted their life to it. Though absorbed in this very successful organising work, Bosscha found time for his discussion of Regnault's measurements, which added much to the value of these classical researches.

Professor since 1873, and director of the Polytechnicum at Delft since 1878, Bosscha found the opportunity to continue his efforts for the reorganisation and development of this institution. He was foremost among those who raised its status to that of a technical university, what it afterwards became officially. Bosscha's clear and fascinating lectures live in the grateful memory of broad circles of his pupils. He was the acknowledged master in criticism of experimental methods. To have felt the influence of his insight, inspiration, and high aims was to be full of admiration and gratitude for one's life. The main scientific work undertaken by Bosscha in this period was in relation with the new Dutch standard metres; an investigation of Fizeau's focussing method was the starting point for a study which led him to the development of a complete theory of centred optical systems. The series of Bosscha's metrological researches will always be regarded as a masterpiece of scientific work of precision.

To uphold Holland's honour in the domain of science was Bosscha's constant aim all his life. Having accepted in 1885 the secretaryship of the Dutch Society of Sciences at Haarlem, he became the soul of this institution. His manifold occupations—it will suffice to mention the reorganisation of the Dutch Meteorological Service—were all directed to the promotion of science, the extension of its influence, and the increase of sympathy for Dutch science abroad. Working to the end of his life with unimpaired power of thought, vivacity of appreciation, and glowing love for what was right, serving science with his enthusiasm and eloquence, he was always honoured by the Dutch physicists as their leader. The last years of his life were devoted to the edition of Huygens's correspondence and works. To his literary talents and his passionate love for historical justice we owe many vivid pictures of past scientific life. As to Huygens, it may be said that he was resuscitated by Bosscha, and no less talents than his were needed to get all from Huygens's hand presented to the scientific world in a form corresponding to Huygens's greatness.

Bosscha's increasing veneration for Huygens was well in harmony with his own searching love for truth, his aristocratic turn of mind, and his profound sense of beauty. He combined great courage and force of mind with an almost childlike simplicity and trustfulness and an infectious optimism. We lose in him a noble, frank character, and a friend to whom one never went without being warmed by his kind affection and stimulated by his faith that the future belongs to the great ideas.

H. KAMERLINGH ONNES.

NO. 2169, VOL. 86]

## NOTES.

DR. FREDERIC A. LUCAS has been appointed to succeed Dr. H. C. Bumpus as director of the American Museum of Natural History, New York, and will take office on June 15. The new director, who is now in his sixtieth year, has been chief curator of the Brooklyn Institute of Arts and Sciences since 1904. He had previously served for twenty-two years in various posts in the U.S. National Museum at Washington. As an author he is best known for his books and papers on palæontology and comparative anatomy, as well as on museum methods.

PROF. UGO MONDELLO, director of the geophysical observatory at Leghorn, has accepted the post of director of the Observatorio Regional do Rio Grande do Sul, Brazil.

LORD CURZON OF KEDLESTON has been elected president of the Royal Geographical Society in succession to Major Leonard Darwin. Captain H. G. Lyons, F.R.S., has been appointed one of the honorary secretaries, and Sir G. D. Taubman Goldie, F.R.S., the foreign secretary, of the society.

THE Hanbury medal of the Pharmaceutical Society for 1911 has been awarded to M. Jean Eugène Léger, of Paris. The new medallist is chief pharmacist to the Hôpital St. Louis at Paris, and a member of the committee of revision of the French pharmacopœia.

DR. J. G. FRAZER (author of "The Golden Bough," &c.) has been elected a member of the philosophical-historical section of the Royal Academy of Sciences of Berlin.

WE regret to have to record that at the Paris-Madrid *aéroplane* race at Issy-les-Moulineaux on Sunday last a deplorable accident occurred, causing the death of M. Berteaux, the French Minister of War, and severe injuries to M. Monis, the French Prime Minister. It appears that one of the competitors in the race, M. Train, finding that neither the engine nor rudder of his machine was working satisfactorily, decided to descend, and in endeavouring to avoid coming into contact with a detachment of cuirassiers and the spectators, dashed into the group of Ministers and their party, who only came into the aviator's view as the cuirassiers rode clear of the group, with the lamentable result given above.

WE announce with deep regret the death, on Saturday last, at the age of eighty-seven years, of Dr. N. Story-Maskelyne, F.R.S.

WE regret to notice the death, which took place on Monday last, of Mrs. W. P. Fleming, the curator of astronomical photographs at Harvard.

THE death is announced of Prof. B. Peter, for many years the first assistant at the Leipzig Observatory. Prof. Peter was born at Weida, in Saxe-Weimar, in 1853, and studied medicine at the University of Jena, but his liking for mathematics and natural science led him to accept a position, under Prof. Karl Bruns, at the Leipzig Observatory in 1876. Six years later he was advanced to the position of first observer, and in 1899 was named professor of practical astronomy, holding both posts until his death.

MR. ROBERT SERVICE, who has just died at Dumfries, was one of the best naturalists in Scotland. His profession of nurseryman and seedsman prevented his attending a university, and also involved close attention to business for every working day. Nevertheless, he knew intimately the haunts of every bird in the south of Scotland. Not only so, but he thoroughly understood

mammals, fishes, Amphibia, and reptiles. He was an excellent entomologist, and took an especial interest in bees and the larger Diptera. Most unfortunately, his published papers represent but a very small part of this wide acquaintance with birds and beasts of all kinds. He was never able to afford the heavy cost of publication which must, for some inscrutable reason, always be incurred in Great Britain if a book is of a scientific nature. Much of his work is included in the recent "Birds of Dumfriesshire," by Mr. H. S. Gladstone, but by far the greater part of it is lost. It is by no means unusual for working men to be real naturalists, at least in Scotland; but Robert Service was far more scientific, and had a far wider knowledge than even Edwards and Dick, whose names are known to the general public. He managed somehow to keep abreast of modern authorities, in spite of the difficulties involved by residence in a small country town. His death is a serious loss to the natural sciences in the south of Scotland, and under present conditions it is a loss that cannot possibly be repaired.

The *Times* announces that enough money having been raised by subscription for the erection of a statue to Captain Cook, permission has been given for the statue to be placed on the Mall side of the Admiralty arch, at the end of the Processional road, on the right hand going towards Charing Cross, and the execution of the statue has been entrusted to Sir Thomas Brock, K.C.B., R.A.

ACCORDING to *The Pharmaceutical Journal*, a statue to the memory of Priestley is to be erected in the marketplace of Birstall, the town of his birth.

THE committee of the Robert Koch memorial endowment for the encouragement of research in the subject of tuberculosis has decided to give grants to Prof. Schieck and Dr. Krusius for investigations on tuberculosis of the eyes, to Dr. Weinberg for statistical inquiries relative to tuberculosis, and to Prof. Gaffky for the continuation of his researches. Since the year 1908 the sum of 3600*l.* has been expended by the committee in scientific work.

THE new Research Institute of the Cancer Hospital was opened on Tuesday by the Duke of Connaught, who said he hoped that the institute might be the forerunner of wonderful discoveries in combating the disease of cancer, and that success would be the result of the labours of those who should engage in research.

THE conversazione of the Royal Society of Arts will be held on Tuesday next—May 30—in the galleries of the British Museum (Natural History), from 9 p.m. to 12.

ON Tuesday next, Prof. W. W. Watts will deliver the first of two lectures at the Royal Institution on "Charnwood Forest: its Ancient Volcano and its Fossil Landscape"; on Thursday, June 1, Mr. T. Thorne Baker begins a course of two lectures on (1) "Changes Effected by Light," (2) "Practical Progress in Wireless Telegraphy"; and on Saturday, June 3, Dr. W. L. Courtney begins a course of two lectures on "Types of Greek Women." The Friday evening discourse on June 2 will be delivered by Commendatore G. Marconi on "Radio-telegraphy," and that on June 9 by Prof. Svante Arrhenius on "Applications of Physical Chemistry to the Doctrine of Immunity."

THE fifty-fourth general meeting of the Institution of Mining Engineers will take place on Thursday, June 1, in the rooms of the Geological Society. The following papers are announced for delivery:—A flame test for the estimation of oxygen and black-damp in naked-light mines, by

Dr. J. S. Haldane, F.R.S.; An experiment on the effect of reversing the main air-current, by Mr. J. Bain and Dr. J. S. Haldane, F.R.S.; Notes on contrivances designed to prevent over-winding, with some instances of their failure, by Messrs. W. H. Pickering and G. Poole; The Otto-Hilgenstock direct-recovery process and its application, by Mr. E. Bury. The following papers, which have already appeared in the Transactions, will be open for discussion:—The mining school at Bochum, Westphalia, by Prof. H. Louis; Progress in the use of exhaust steam-power, by Mr. J. Burns; The Elliott-Jones vertical coke-oven, by Mr. T. C. Futers.

AN International Rubber and Allied Trades Exhibition will be held in the Royal Agricultural Hall from June 24 to July 14, and on July 3 there will be a rubber conference at which the many problems in connection with the industry will be discussed.

THE eighth International Congress of Applied Chemistry is announced to be opened, at Washington, by the President of the United States on September 4, 1912; the further meetings of the congress will be held in New York from September 6 to 13. The congress will be divided into twenty-three sections and subsections, and papers intended for presentation or publication should reach the American committee not later than July 1, 1912.

THE preparations of the German Antarctic Expedition were completed at the beginning of May, and on May 7 the *Deutschland* sailed from Bremen. Lieut. Filchner will join the ship in Buenos Ayres in four months' time, whither additional stores and equipment are also being sent. The general plan is to enter the Weddell Sea to the south of South America, and endeavour to establish the relation of the masses of land lying east and west of the South Pole. Great importance is attached to the installation of a land station and its maintenance for so long a period as possible. From this point geographical, geological, astronomical, magnetic, meteorological, and biological work will be carried on by the staff of eleven members of the expedition, who will be here quartered. Four of them will make a dash for the South Pole with Nansen sledges. The ship, the *Deutschland*, is a converted whaler with auxiliary steam of about 300 horse-power, and has been especially fitted with a view to the comfort of the explorers. She is equipped with a wireless telegraph installation, and is taking out three motor vehicles and one motor boat, since motor transport is to be largely employed, though both dogs and Manchurian ponies are also to be utilised.

SPEAKING in the House of Commons on Wednesday of last week on the Budget proposals, Mr. Balfour asked the Chancellor of the Exchequer to exercise caution in carrying out his scheme for the expenditure of large sums of money on building consumption sanatoria. In the public mind, he said, there had perhaps been an exaggerated enthusiasm for this method of dealing with tuberculosis. There was an idea that this open-air treatment had produced such marvellous results that through it alone tuberculosis could be, if not exterminated, at all events diminished to such an extent that it might be reduced to one of the rare zymotic diseases. He was not sure that the most recent investigations bore out that view. There were very able investigators who took the view, after examining the actual results in this country and in Germany, that so many complete cures must not be expected as was at one time hoped for. He took a sanguine view as to the treatment of tuberculosis, for he believed that science had made great strides and was still destined to make great strides, but



when they came to such large sums as those mentioned by the Chancellor of the Exchequer, it was possible to waste money on permanent buildings which might be better devoted to scientific investigation into the cause of the disease. They must not assume that all that they had to do was to spend money on these sanatoria in order to effect a cure. What was important was that medical science had made great progress, and we required further investigation and perpetual study as to how these people were to be treated when in the sanatoria. One of the greatest benefits, perhaps, of establishing these sanatoria would be in giving expert medical authorities the opportunity of carrying on investigations which would enable them in the future to deal with this disease in a way they were not able to do at present. In reply, Mr. Lloyd George said he agreed that the important thing was to encourage scientific investigation, so as to arrive at the best methods of cure. That was provided for in his Bill. There would be set aside a special fund for the purposes of scientific research. The Government would make use of and assist existing sanatoria, those which had been maintained by voluntary contributions, and even those which were built by private enterprise.

At a meeting of pathologists interested in medical museum work, recently held at the Royal College of Surgeons of England, for the purpose of receiving information upon the International Association of Medical Museums, and with a view to extend the membership and general usefulness of that body in Great Britain, the following resolutions were passed:—(1) That after the arrangements for the meeting of the International Congress of Medicine at London in 1913 are completed, steps shall be taken to arrange for a meeting of the International Association of Medical Museums in conjunction with this congress. (2) That the three great English medical societies, namely, the Pathological Society of Great Britain and Ireland, the Anatomical Society, and the Royal Society of Medicine, be made cognisant of the action of the International Association of Medical Museums, and that co-operation with these societies be attempted with special reference to the publication in their journals of the Department of Exchanges, as well as announcements and short reports of meetings. (3) That one or more correspondents in London be appointed to act as local secretaries.

THE Entomological Society of London held a *Conversazione* on Wednesday, May 17, in the rooms of the Linnean Society, which had been kindly lent for the purpose. The exhibits were very varied, and there was much to interest the non-entomological as well as the scientific portion of the assembly. The "livestock," including Observation Nests of ants with various myrmecophilous insects, shown by Messrs. Donisthorpe and Crawley, larvæ and pupæ of British Lepidoptera by Mr. Newman, fleas with ova, larvæ, and cocoons by Mr. Bacot, and "stick insects" in every stage of development by Mr. Baldock, were a constant source of attraction. Many fellows exhibited interesting and attractive insects of various orders, including eight drawers of mimetic Lepidoptera brought by Prof. Poulton, the three newest European butterflies (*Callophrys avis*, *Pieris manni*, and *Erebia palaxica*) by Dr. Chapman, the pick of the results of thirteen years' breeding of *Angerona prunaria* by Mr. Pickett, and a wonderful drawer of gynandromorphs from the Tring Museum. There were several microscopic and photographic exhibits, Mr. Main's stereoscopic photos and Mr. Enock's Mymaridæ deserving special mention, while further variety was secured by Mr. Eltringham's and Mr.

Wheeler's water-colour drawings of butterflies, Mr. Prideaux's method of scale-transference, Prof. Image's interesting books, including Stainton's annotated copy of Wood's "Index Entomologicus," the Obligation Book of the Society with its many interesting autographs, and the various relics of Linnæus exhibited by the Linnean Society. During the evening lectures were given, with lantern illustrations, by Prof. Poulton on "Recent Discoveries in Insect Mimicry," and by Mr. Enock on the Tiger Beetle (*Cicindela campestris*).

A COMMUNICATION has been received from the Decimal Association directing attention to a recent report of the council of the British Medical Association with reference to the adoption of the metric system of weights and measures by medical practitioners. This report recommends that both the theoretical and the practical instruction of medical students in pharmacology and materia medica should henceforth be according to the metric system. As regards practitioners who have been trained in the imperial system of weights and measures, the suggestion is put forward that a transitional procedure should be adopted which, while immediately introducing some of the advantages of the metric system, would also facilitate the change from the old system to the new at a later date. Cooperation with pharmacists will be necessary in order to deal with cases where prescriptions are given to be made up by any chemist the patient may choose. It is recommended that the local divisional bodies should, after ascertaining that medical opinion in their district is ripe for the step, arrange a conference with the local pharmaceutical association in order to arrive at a mutual understanding in the matter.

MR. P. W. STUART MENTEATH continues in *Biarritz-Association* his somewhat controversial papers on "Les Gisements métallifères des Pyrénées Occidentales." Despite the title adopted, the work is mainly directed against the too hasty adoption of the theory of recumbent overfolds as an explanation of the facts of mountain-structure. Numerous sections illustrating the author's observations are given in the third part (March, 1910). The fifth part (March, 1911) criticises the views of Pyrenean structure held by M. Dalloni; but the arguments are marred by a certain obsession in regard to "Darwinisme," the evolutionary theory being held responsible for most of the errors of geologists. Perhaps the same obsession explains a mysterious allusion, at the conclusion of part iv., to the reduction of our "facultés légitimes à celles des singes et des perroquets." Where the author emphasises the effects of ramifying igneous injections, associated with mineral veins, in inducing metamorphism, he seems to be on more serious and surer ground.

THE *Geologische Rundschau* continues to provide admirable essays on current work and problems in geology, in addition to original papers. The "Besprechungen" themselves are original, in that they consist of critical reviews by specialists. H. Potonié brings together his own results under the head of "Kautobiolithe" in part vi. of the first volume, p. 327 (December, 1910). In the following part (March, 1911), R. Lepsius urges that the high watershed in Scandinavia lay to the east of the present one in glacial times, and thus allowed of the recognised movements of the ice. He does not approve of the theory of the ice-dome, and prefers to rely on considerable warping and faulting of the country to account for its present general contour and the basins of many of its lakes. Critics may point out the evidence that exists in Jämtland and

elsewhere of the movement of ice over obstacles rising 1000 metres or more above the glaciated valley-floors. W. von Seidlitz describes in the same number the adventurous excursion organised by Axel Hamberg for five members of the International Geological Congress of 1910. The six geologists, in visiting the Sarek Mountains in Lapland, required a train of six Lapps and twenty-four reindeer. The masses of crystalline rocks overthrust on Silurian strata proved of special interest. In volume ii., part ii. (May, 1911), O. A. Welter notices seventy-three recent papers on nephrite.

THE fourth annual meeting of the American Peat Society was held in Ottawa in 1910, and the proceedings are recorded in full in the journal of the society issued for January, 1911, and published at Toledo, Ohio. The members look to the future rather than to the present; but the rapid consumption of coal-supplies gives a patriotic importance to those who try to develop the use of peat. Of course, the manufacture of ammonium sulphate also comes under consideration. The Canadian Department of Mines has issued a second edition, with maps and engineering drawings, of Bulletin No. 4, on the "Investigation of the Peat Bogs and Peat Industry of Canada during the season 1909-10." The author is Mr. A. Anrep, jun., peat expert, and valuable papers are translated from foreign sources. That on the Ekelund process for drying powdered peat at a high temperature is likely to attract the most attention.

MR. C. D. WALCOTT has carried the history of the indubitable Merostomata back into Middle Cambrian times (Smithsonian Miscellaneous Collections, vol. lviii., No. 2, April 8). Two new genera, Sidneyia and Amiella, are described by him from the Rocky Mountains near Field, on the Canadian Pacific Railway, and are the result of a laborious and systematic examination of the strata. Both genera fall into a new sub-order of the Eurypterida, the Limulava, with four pairs of cephalo-thoracic appendages and simple antennæ, in this resembling the trilobites. Beltina, the fragmental pre-Cambrian form regarded as a Merostome, receives further discussion and illustration, but Redlichia, of the Lower Cambrian of Indo-China, is styled "the oldest Merostome now known."

MUSEUMS in America are in the fortunate and enviable position of being able to draw, in addition to their regular State grants, large pecuniary contributions from private benefactors. In the report for 1910, the American Museum of Natural History acknowledges its indebtedness to this source of revenue, the president remarking that while the "income from endowment has not materially increased, the total gifts towards exploration and exhibition exceed those of any previous year in the museum's history." Even so, the financial resources appear unequal to the demands upon them, for it is further stated that "the addition of three new departments since 1907, namely, of Living Fishes and Reptiles, of Woods and Forestry, and of Public Health, has made serious demands upon our income. . . . Thus the increased endowment afforded by Mr. Jesup's bequest, which cannot by its terms be used for any item of maintenance, is offset by these increases." Among the additions to the exhibited collection, mention may be made of a group of Pribilow sea-bears, of which a photograph is given in the report. A special feature of the year was the unusual number of collecting expeditions, of which there were ten to various parts of the United States and fourteen to other territories.

IN *The Field* of May 13 Sir Ray Lankester gives, under the title of "The Earliest Picture in the World," an NO. 2169, VOL. 86]

illustrated description of a cylinder of stag's antler found in 1875 in the cavern of Lorthet, near Lourdes, Haute Pyrénées, on which are incised figures of three red deer and several salmon-like fish. The specimen belongs to the Elaphotarandian epoch, when the Arctic fauna was being replaced by the animals characteristic of modern Europe. The author gives a flat picture printed off from the cylinder, and adds two restorations of the missing portions of the figures of the deer. In his opinion, the prehistoric engraver worked from a similar flat picture, and it is further suggested that incised cylinders of this type were used by their makers as "blocks" from which to print impressions on birch-bark and other suitable materials.

TO *The Times* of May 15 Dr. Shipley communicates a letter on the so-called "eale" or "yale," in which it is pointed out that the original account was given by Pliny, from whom Topsell seems to have derived the materials for a fuller notice in 1607. These accounts present the animal in a somewhat different guise from those previously quoted. It is described as of the size of a hippopotamus, with an elephant's tail, a black or tanny colour, the jaws of a boar, and two horns, which could be moved independently of each other, of more than a cubit in length. Topsell adds that it was fond of water. Its home was Ethiopia. If the statement as to its size be trustworthy, the only animal that would accord with the description would be an African rhinoceros; and we believe there are legends as to the mobility of the horns of the latter. On the other hand, rhinoceroses were known to the ancients. Whatever be the truth on this matter, it seems impossible to identify the antelope-like or goat-like animals in the arms of Christ's College with Pliny's eale.

ACCORDING to the report for 1910, the Natural History and Polytechnic Society of Bootham School, York, continues to attract a satisfactory number of working members, the natural history section including sixty-five scholars. Meetings and excursions were held from time to time, and the admirable practice of inducing the members to keep diaries, based on actual observations, has been continued.

THE hon. secretary of the Selborne Society informs us that the nesting boxes made from natural logs which the society introduced at the beginning of the year have been very successful. In some cases correspondents (who number well over seven hundred) have had all the boxes which they have put up tenanted, and a special experiment made in the Brent Valley Bird Sanctuary has resulted in possession being taken of all but one of the boxes concerned. The committee of the society has arranged an exhibition of the boxes in the science section of the Coronation Exhibition, and photographs of the boxes, showing the nests within and the birds sitting, will be published in "The Country Home" for June.

THE report of the advisory committee for the Tropical Diseases Research Fund for the year 1910 (Cd. 5514, 128 pp.) shows that the campaign against these diseases is being prosecuted vigorously from the several aspects of prophylaxis, treatment and research into the structure, life-history, and modes of transmission of the causal organisms. Prof. Ross and Dr. Thomson have shown that, by the use of improved methods, malarial parasites can be found in the blood in the apyrexial periods, occurring in numbers so small as 20 per cubic mm. Relapses are thus explicable as the result of the usual mode of increase in the number of such parasites; the presence of crescents reproducing parthenogenetically is not essential for the production of a relapse. Dr. Wenyon has given



an account of his investigations, carried out at Bagdad during the summer of the past year, on Oriental sore; his experiments indicate that *Stegomyia* is under suspicion as the transmitter of this disease. Numerous other important researches, completed or in progress, are reported upon, e.g. by Prof. Minchin on trypanosomes and fleas, Dr. Woodcock on *Halteridium*, Dr. Castellani on a type of bronchitis common in Ceylon, and due apparently to the attack of a new species of the fungus *Oidium*, Drs. Fraser and Hight and others on beri-beri in the Malay States and Siam.

To the Bulletin of the Johns Hopkins Hospital for May (vol. xxii., No. 242) Dr. Pearce Bailey contributes an article entitled "A Florentine Anatomist." This is no other than that versatile genius Leonardo da Vinci, who planned to write a treatise on anatomy in one hundred and twenty volumes, and left note-books rich in drawings with marginal explanations, and he was the first to acquire an accurate knowledge of descriptive anatomy. A short biographical sketch of Sir Richard Owen is also contributed by Dr. Rohrer, with four characteristic portraits and an illustration of Sheen Lodge, where his last days were passed.

THE catalogue of additions to the library and the list of new garden plants of the year 1910 have been issued as Appendix II. and Appendix III. to the current volume of *The Kew Bulletin*. In the former the printing is confined to one side of the page, so that the titles may be cut out and used as index slips; the latter provides an authentic list of correct names. As in recent years, an outstanding feature of the new garden plants is the predominance of Chinese novelties, although, except for eight species of *Rubus*, the additions are scattered through numerous genera; the introductions traceable to Mr. E. H. Wilson's last journey are beginning to arrive through the Arnold Arboretum and other sources. Several fine orchids have, as usual, been introduced by Sir Trevor Lawrence; among those which gained botanical certificates were *Megaclinium fuscum* and *Polystachya paniculata* from Africa, and *Dendrobium karoense* and *Bulbophyllum polyblepharon* from New Guinea.

A NUMBER of new records of flowering plants and ferns for the National Park, Wilson's Promontory, Victoria, are noted by Mr. J. W. Audas in *The Victorian Naturalist* (vol. xxvii., No. 11), which raise the total to 600 species. Amongst them are species of *Pterostylis*, *Xanthosia*, and *Hydrocotyle*, an uncommon creeper, *Myriophyllum amphibium* and *Selaginella Preissiana*. The list includes some apparent aliens, such as *Fumaria officinalis*, *Nasturtium officinale*, and *Spergularia rubra*. Several plants were noted as rapid colonisers on burnt ground, of which *Burchardia umbellata* was the most conspicuous. A succulent form of *Stackhousia umbellata* was found on the beach where the crimson and occasionally white-flowered *Kennedyia prostrata*, the "running postman," attracted attention; on the sand dunes, the grasses *Spinifex hirsutus* and *Festuca littoralis* proved their value as efficient sand binders.

AN interesting report on the progress of agriculture in India is issued from Pusa. The improvements in cotton-growing are now making themselves felt in many thousand acres of the great cotton areas in the presidencies of Bombay and Madras and in the Central Provinces, while the plant-breeding work of the United Provinces seems likely materially to improve the crop there. Special mention is made of the wheat-breeding experiments, which have now reached considerable dimensions, and have re-

sulted in the production of varieties better in quality than anything yet grown in India. Progress is also recorded in the reclamation of the salt lands of Sind, and in the rigorous campaign against the palm disease in the Godavery delta, which has resulted in the saving of lakhs of rupees every year. Progress in agricultural education has, however, been slower than in investigation, but the cause is not far to seek—colleges have had to be built and staffs collected before much could be done. But the beginning is made, and good work may be looked for here also.

WE have received copies of the South African National Union Journal, the organ of a society having for its object the encouragement of South African industries. A number of articles are published showing the products that South Africa can supply for which there is a good market, and we note that stress is laid on the importance of keeping up the supplies of maize and of bacon. Mr. Burt Davy writes on the value of peanuts for human food, and argues that, for the strict fruitarian, peanuts are not only the cheapest, but also the best source of energy.

THE opening up of British West Africa is dealt with at some length in No. 4 of *Tropical Life*. The five colonies S. Nigeria, N. Nigeria, the Gold Coast, Lagos, and Sierra Leone can, it is claimed, produce nearly every important tropical product except perhaps tea and sugar. Much, however, is needed in the way of organisation; trade routes are needed, land laws require amending, and labour supplies have to be arranged. An association has recently been formed with the object of accomplishing some of these objects.

WITH characteristic thoroughness, the Americans are introducing agricultural education into the Philippines. It is less than two years ago that the first agricultural college was started at Los Baños with twelve students, the classes being held in tents, with no appliances, not even blackboards, at first, and with so few seats that the students had to carry their stools about with them. Now it has a hundred students, laboratories, and class-rooms, and by next year will have accommodation for five hundred students. We have received the first two numbers of its journal, *The Philippine Agriculturalist and Forester*, published by the "student body" of the college, and containing interesting accounts of agriculture as it now is, and of possible improvements on present methods.

IN the year 1907 the Jamaica Weather Service, which had been dormant for some years, was resuscitated and associated with the United States Weather Bureau, which placed at its service an electrical recording anemometer by Friez, designated a "triple register." The Kingston Observatory has now published the results of wind direction and velocity between August, 1908, and July, 1909, for each hour and month. The tables show in all months a gradual increase in velocity from midnight to 1h. or 2h. p.m., followed by a decrease. Another prominent feature of the diurnal range is the sudden decrease for a little time just after sunrise, owing probably to the gradual disappearance of the land breeze. By extracting the number of miles from each direction, it is shown that 51.2 per cent. of wind comes from the S.E., and 23.9 per cent. from the north (land wind). The average hourly velocity of the former is 11.2 miles, of the latter only 4.0 miles. The annual resultant derived from the hourly components is E.S.E.  $\frac{1}{4}$  E. 2.5 miles per hour. During the period under review the greatest hourly velocity was 30 miles (factor 3).

AN average rainfall map with isohyets of Victoria compiled from yearly records available for a period of 15 years

and upwards has been received from the Central Weather Bureau at Melbourne. It has been drawn to the same scale as that of New South Wales (published last year), the two forming a comprehensive and valuable rain-chart of the south-eastern portion of Australia. The average rainfall of Victoria is 27.19 in., ranging from 10.80 in. in the Mallee district (north-west) to 68.75 in. in Cape Otway Forest district (south). The map shows an approximate distribution as follows:—40—> 60 in. over an area of 12 thousand square miles; 20-40 in. over 43½ thousand, and < 15-20 in. over 32½ thousand square miles. The great influence of proximity to the mountains and seashore is plainly shown; the abundant rains on the Australian Alps, Cape Otway, and Gippsland ranges being particularly conspicuous.

In a paper read before the Royal Photographic Society, Mr. Chapman Jones dealt with the relationship between the size of the particle and the colour of the image in the case of lantern-slides developed to show a coloured deposit. The author referred to Zsigmondy's statement that the colour of colloidal solutions has no direct dependence upon the size of the particle, and his suggestion that the cause of the colour is not to be sought for in the sizes of the particles, but rather in the distances between them. Mr. Chapman Jones has investigated the matter, not by the usual ultramicroscopical method, but by enlarging the particles by mercurial intensification. Mercury is added in definite proportions by treating the film containing the particles first with mercuric chloride and then with a ferrous oxalate developer, each treatment adding one atom of mercury to each atom of silver, or of silver and of mercury that is present, the linear enlargement for eight enlargements, the maximum employed, being 7.134. The enlarged particles were then measured by means of a microscope and eye-piece micrometer, the accuracy of measurement being about 5 per cent. The results obtained showed that films that gave the same colour contained particles of approximately the same diameters, particles below 0.10 micron giving no visible colour; particles from 0.10 to 0.13, yellow; from 0.14 to 0.17, orange; from 0.17 to 0.19, pink, brown, or purple; and particles above this size, grey. No connection between the distance apart of the particles and the colour was found, but a measurement of the refractive index of gelatin and calculation of the half wave-length of light in gelatin, showed that the size of the particle giving a definite colour could be taken to correspond approximately with the half wave-length of light the absorption of which would give that colour, the particles being rather smaller than the calculated half wave-lengths. The authors conclusions are that the size of the particle is the determining factor in selective scattering, and that light is scattered by particles that approximate in diameter to half a wave-length of the scattered light.

*Himmel und Erde* for April 29 contains an article by Prof. B. Donath, of Berlin, on the gyrostat and its technical future. After explaining the precessional motion of a gyrostat by means of the ordinary toy, Prof. Donath gives an account of Schlick's application of the gyrostat to the diminution of the rolling motion of ships, and hints that a similar device may in the future form part of the equipment of the aeroplane. The greater part of the article is devoted to the applications of the gyrostat to mono-rail transport by Brennan and by Scherl, and to the gyrostatic compass by the brothers Anschütz. In the case of the compass, the theory is clearly explained, and views of the various parts of the instrument are given. The author is naturally optimistic as to the future of the com-

pass, but expresses himself more guardedly as to that of the mono-rail.

THE opportunity for the dissemination of nature knowledge offered by the boy scout organisation should not be lost sight of by those who desire to see the study of natural phenomena become more popular in the future than it has been—unfortunately for us and for our boys and girls—in the past. A lecture recently delivered in Leeds by Mr. Elgie was, according to *The Leeds Mercury*, attended by some 400 of the scouts, who paid enthusiastic attention to the lecturer's instruction as to the apparent movements of the stars, their grouping in constellations, and the simpler methods by which geographical direction may be ascertained from observation of the heavens. These same subjects are, we understand, also dealt with by Sir Norman Lockyer, in an additional chapter, in the new edition of his "Primer of Astronomy"; in this chapter the author shows the disposition of the most easily recognised asterisms throughout the year, so that the scout may, on recognising any group of stars, determine at once the cardinal points, and so find his direction. Workers in other fields of science, e.g. geology, botany, &c., might usefully give a little time to the simple instruction of the young people already so admirably organised by the general movement.

*The Cairo Scientific Journal* for April contains a paper on work under compressed air at the Boulac Bridge, read by Mr. Arthur J. Knowles before the Cairo Scientific Society on March 2. The Nile at Boulac is very deep; in places there are more than 66 feet of water at low Nile. The number of men who actually worked in compressed air during the sinking of the piers and abutments of the bridge was 493. One hundred and fifteen cases of illness were dealt with by the doctor, one man being attacked three times, thirteen men twice (one fatally), and eighty-six men were attacked once (three fatally). One case resulted in total deafness, four were fatal, and the remaining cases completely recovered. Two of the fatal cases were due to the heart and circulatory system, one to the lungs, and one to hæmorrhage of the spinal marrow. The majority of the cases were of pains, cramp, slight palsy, and temporary paralysis of limbs and joints. The labourers were all natives of Egypt, supervised by Europeans, but the latter were not in the compressed air for such long periods as the labourers. The author regrets the non-provision by the contractors of a medical air-lock, into which men suffering from the effects of too rapid decompression can be put and recompressed. This remedy is almost universal in English and American practice, and has been attended with great success.

THE Cambridge University Press announces for early publication in the series of "Cambridge Manuals of Science and Literature" "Aërial Locomotion," by Messrs. E. H. Harper and A. Ferguson, and "Electricity in Locomotion," by Mr. A. G. Whyte. The first-named work will contain an introduction by Prof. G. H. Bryan, F.R.S.; and chapters on general principles, propellers and motors, stability and control of aeroplanes, model aeroplanes and gliders, aeroplanes, dirigibles, &c., and Mr. Whyte in his volume will give an account of the application of electricity to locomotion and show the present condition of affairs and the developments which may be looked for in the near future. There are to be chapters on the mechanism of the overhead and of the "stud" systems, on electric railways and on electric traction on main line railways. There will also be a discussion of petrol-engine electric power.

THE age of Sir Nathan Bodington, given in *NATURE* of last week as eighty-two, was sixty-two years.